STATE OF ALASKA

William A. Egan, Governor

Annual Progress Report for

LAKE AND STREAM INVESTIGATIONS

by

E. T. McHenry *S. W. Kubik*

D. A. Watsjold *P. Kepler*

ALASKA DEPARTMENT OF FISH AND GAME

James W. Brooks, Commissioner

DIVISION OF SPORT FISH

Rupert E. Andrews, Director

Howard E. Metsker, Coordinator

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RESEARCH PROJECT SEGMENT

State: Alaska

Project No.: F-9-5 Name: Sport Fish Investigations of Alaska

Study No.: G-II Study Title: Sport Fish Studies.

Job No.: G-II-D Job Title: Salmonid Rearing and Migration Study: Ship Creek System.

Period Covered: May 1, 1972 to April 30, 1973.

ABSTRACT

During 1972, a total of 87,700 silver salmon, Oncorhychus kisutch, and 71,800 king salmon, O. tshawytscha, smolts were fin-marked and released into Ship Creek.

Returning adult salmon were enumerated at the Chugach Power Plant Dam fish ladder facility. Of the 107 king salmon counted 36% (39) were identified as fin-marked fish. A total of 85 silver salmon were enumerated with 17.6% (15) identified as hatchery released fish.

The egg-take for 1972 was comprised of 220,300 king salmon eggs.

The 1972 sport catch of both king and silver salmon was relatively poor. During the six-day king salmon season creel census results indicated 14 salmon caught. A total of 63 silver salmon were creel checked during the September fishery.

The fish ladder facilities in the Chugach Power Plant Dam were modified to provide improved fish passage for returning adult salmon.

RECOMMENDATIONS

Returns of hatchery reared salmon to Ship Creek have been below expectations since the inception of the Salmonid Rearing and Migration Study. Suspected causes of low returns include: a low quality of reared juveniles, fish disease problems, inadequate numbers of fish released, and liberation of small size migrants.

In order to properly assess the contribution of fin-marked salmon it will be necessary for the hatchery section to provide adequate numbers of king and silver salmon fingerlings for larger scale liberations.

Until such time that these requirements can be met, it recommended this research project remain inactive.

OBJECTIVES

1. To evaluate the contribution of hatchery-reared and marked king and silver salmon smolt released in Ship Creek to the returning adult run.

2. To evaluate the abundance, timing, and biological characteristics of native stocks of returning adult Ship Creek king and silver salmon.

3. To determine the sport fish catch of king and silver salmon, and to evaluate trends in angling effort.

4. To provide recommendations for the management of anadromous fish in Ship Creek.

TECHNIQUES USED

King and silver salmon smolts were anesthetized with tricaine methanesulphonate (MS-222) marked by fin-clipping and released into Ship Creek.

Returning adult king and silver salmon were enumerated at the Chugach Power Plant Dam fish ladder facility. All were checked for fin-marks. King salmon were captured and held for the procurement of eggs.

Creel census was conducted during the king and silver season to accumulate data on angling harvest. Biological sampling consisted of obtaining the fish length, sex, and scales from a small percentage of the harvest.

Sport Fish personnel monitored segments of the commercial fish harvest in Upper Cook Inlet, by checking a local cannery, Whitney Fidalgo Seafoods, for fin-marked returns of king and silver salmon.

FINDINGS

King salmon, Oncorhychus tshawytscha, have been reared at the Fort Richardson Cooling Pond, marked, and released into Ship Creek since 1963 in an effort to enhance the anadromous stocks in that creek. The silver salmon, O. kisutch,

program with the same objective began in 1968. Approximately 1,190,794 king and 526,023 silver salmon have been marked and released into Ship Creek during the past nine years. A summary of fish planted since 1964 is presented in Table 1.

A description of the Cooling Pond is presented in Federal Aid Fish Restoration Annual Report of Progress, Volume 4 Job No. 8-C-4, 1962-1963. Past information collected on this project are presented in Dingell-Johnson Reports by Gretz (1963) and Kubik (1964 through 1971).

Mark & Release

A total of 71,800 king salmon smolts (1971 brood year) were released from the Ft. Richardson Cooling Pond into Ship Creek during the spring of 1972 bearing adipose-right ventral fin mark. The smolts were from local Ship Creek stocks.

The release of 1970 brood silver salmon from Kodiak stocks into Ship Creek totaled 87,700. The silvers were marked with an adipose clip and released during the month of May.

Marked Returns

King Salmon:

Hatchery reared returns of king salmon to Ship Creek during 1972 was disappointing. A total of 39 fin marked fish representing three separate release years were recovered (Table 2).

Silver Salmon:

A total of 14 adult fin-marked silvers from the 1971 release were checked at the Chugach Trap facility in 1972. Adult fin-marked silvers ranged in length from 560 to 700 mm with a mean of 647 mm. One returning jack, 310 mm in length, from the 1972 release was also captured. The number of hatchery marked silvers was considerably lower than the 1,024 enumerated through the same facility during 1971.

Sport Fishery

King Salmon:

Effort during the six-day fishery was estimated at 2,726 man-hours with a harvest of 14 king salmon. Most of the fishing effort (73%) was concentrated during the last two days of the season when the total harvest (14) was recorded.

Table 1 Ship Creek King and Silver Salmon Releases - Ft. Richardson Cooling Pond 1964 - 1972.

Species	Brood Year	Source	Total No. Fish Planted	Mark	Size Released	Date
King Salmon	1971	Ship Creek	71,800	Ad - Rv	17 to 22.6/lb	May 1972
Silver Salmon	1970	Kodiak	87,700	Adipose	14.5 to 15/lb	May 1972
King Salmon	1970	Ship Creek	181,638	Adipose	15.8 to 21/lb	May 1972
Silver Salmon	1969	Bear Lake	30,465	Adipose	14.5/lb	May 1971
King Salmon	1969	Ship Creek	45,690	Adipose	29/lb	May 1970
Silver Salmon	1968	Bear Lake	177,240	Adipose	10 to 11/lb	May 1970
King Salmon	1968	Ship Creek	95,900	Adipose	16.6/lb	May 1969
Silver Salmon	1967	Eagle Ck.,OR	101,300	Adipsoe	13.7/lb	May 1969
King Salmon	1967	Ship Creek	81,316	Adipose	28.5/lb	May 1968
Silver Salmon	1966	Big Ck., OR	129,318	Adipose	19.9/lb	April 1968
King Salmon	1966	Green R., W	474,516	Adipose	58.4/lb	May-June 6
King Salmon	1966	Ship Creek	63,852	Adipose	18.6/lb	May 1967
King Salmon	1965	Green R.,WA	116,870	Half Dorsal	98/lb	July 1966
King Salmon	1964	Green R.,WA	8,432	Left Pectoral	3.9"	August 196
King Salmon	1964	Ship Creek	352	Adipose	3.0"	March 1965
King Salmon	1963	Ship Creek	428	Right Pelvic & Adipose	3.0"	June 1964
Total			1,716,817			

Ship Creek was open to king salmon fishing from its mouth upstream to a mark 300 feet below the Chugach Power Plant Dam, a distance of approximately 1/2 mile. A king salmon punch card was required for all anglers and the same bag limits set in 1971 were in effect for the 1972 season: one king salmon over 508 mm in length per day, and two kings per season.

High water conditions during the regular season, June 10-11; 17-18, precluded the taking of any salmon, so the season was extended one weekend, June 24-25.

Ten of the sport harvested kings measured, ranged in length from 610 to 1,120 mm and averaged 863 mm. Six were sexed as males, four as females. Age composition of the catch indicated 40% were four years old, 40% were five years old; and 20% were six-year-old fish.

Silver Salmon:

Ship Creek was open to silver salmon fishing below the Chugach Power Plant Dam on August 1. Creel census data collected during the fishery indicated 2,841 man-hours of fishing effort with a harvest of 63 salmon.

The ratio of unmarked to marked silvers in the sport fishery was 3:1. Unmarked fish ranged from 580 to 720 mm in length and averaged 634 mm; marked silvers averaged 650 mm, with a range of 534 to 750 mm in length. All of the fin clipped fish were 1970 brood, released in 1971.

Escapement

King Salmon:

King salmon normally enter Ship Creek in early June, with spawning occurring in late July or early August.

Returns of king salmon to Ship Creek were below expectations and the 1972 run appears to be the smallest since 1967. A total of 107 salmon were enumerated through the Chugach Dam live trap and an additional 14 were observed during ground escapement counts upstream from the ladder facility. King salmon not held at the fish ladder for the procurement of eggs were marked with a floy tag before being released back into the creek so as not to be enumerated a second time on the spawning grounds.

Of the 107 king salmon enumerated through the trapping facility, 91 were adults, 16 were jacks. Thirty-six percent (39) of the kings were hatchery-reared fish. Marked returns (adults) averaged 1,006 mm in length and ranged from 660 to 1,219 mm; unmarked adults ranged in length from 533 to 1,206 mm and averaged 998 mm.

Silver Salmon:

The 1972 silver salmon escapement into Ship Creek was considerably lower than the 1971 run. A total of 85 silvers were counted through the ladder facility. The ratio of unmarked to marked fish was 6:1.

Unmarked fish ranged from 490 to 730 mm in length averaging 619 mm while hatchery returns averaged 648 mm with a range of 560 to 700 mm in length. The male-female ratio of unmarked fish was 2:1, for marked fish 1.3:1.

Egg-Take Investigations

Approximately 220,300 king salmon were obtained from Ship and Campbell Creek stocks; an increase of 16.5 percent over 1971. Eggs taken at the trapping sites were shipped to the states Fire Lake Hatchery for incubation. Precluding large subsequent losses, the number of eggs obtained should be adequate for the 1973 king salmon release program.

The length of 28 females used for spawning ranged from 940 to 1,080 mm and averaged 1,011 mm; 22 males averaged 1,046 mm with a length range of 902 to 1,207 mm. These fish were five and six-year-old adults.

Silver salmon eggs were not obtained during 1972 due to the poor adult run in Ship Creek. During 1972 a total of 604,600 eggs were artificially spawned from silvers captured at the Chugach Ladder facility.

Commercial Fishery

Periodic observations of commercial harvested king and silver salmon were made at a local cannery in an effort to identify and enumerate hatchery released stocks returning to Ship Creek, and to determine if sampling techniques were adequate and sufficiently valid to evaluate the contribution of hatchery fish to the commercial harvest. Unfortunately there wasn't adequate opportunity to sample the commercial catch, and extrapolation of commercial catch sampling information appears invalid.

King Salmon:

During 1972, a total of 3,176 king salmon harvested commercially in Cook Inlet were checked for fin-marks: Twenty-two or 0.69% of the sampled fish were hatchery marked. Twenty of the marked kings ranging from 980 to 1,191 mm were 1968 brood fish, released in 1969, the remaining two, measuring 650 and 722 mm in length respectively, were part of the 1970 release.

The 1972 Cook Inlet commercial fish harvest of king salmon totaled 16,108.

Table 2 Marked King Salmon Returns, Ship Creek 1972.

Release Year	Brood	No. Returns	Length Range in mm
1971	1970	5	400-457
1970	1969	1	660
1969	1968	33	940-1,219

Table 3 Numbers and Species of Fish Captured in the Chugach Trap, 1969-72.

FISH SPECIES *

Year	KS	SS	PS	CS	RB	DV	Total
1972	107	85	147	165	1	4	509
1971	123	1,206	---	41	-	-	1,370
1970	247	747	148	39	3	10	1,194
1969	459	142	211	62	-	--	874

*KS-King salmon
*SS-Silver salmon
*PS-Pink salmon
*CS-Chum salmon
*RB-Rainbow trout
*DV-Dolly Varden

Silver Salmon:

Twelve adult silver salmon from the 1971 Ship Creek release (1970 brood) ranging in length from 545 to 760 mm were identified at the local cannery. No reliable estimates can be expounded on the number of marked silver in the commercial harvest because of the small sample size.

The Cook Inlet commercial fish harvest of silver salmon totaled 82,566.

Chugach Dam Fish Trap

From June 21 through October 9, a total of 504 salmon were enumerated at the trap facility. The catch results by species and number is presented in Table 3.

Modification of the fish ladder was completed during 1972. Six of the existing bulk-heads were modified to include construction of new orifices and overflow weir openings. An auxiliary water intake system (diffuser) was incorporated to facilitate fish movement into the ladder. Decking was constructed in the ladder exit area for handling of fish.

Elmendorf Fishway

In the spring of 1972, a steep pass type fishway was installed in Ship Creek at the Elmendorf Dam replacing the existing pool and weir structure.

During June and July, high water flows prevented upstream passage of all species of salmon. Debris interfered with the ladders operation and water over the dam created a turbulent pool so the fishway entrance was not easily found. During low water flows in the creek (August-September) the ladder did not discharge enough water to attract fish at its downstream end. As a result, many fish were found to spawn in unfavorable lower creek area.

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Prepared by:

Stanley W. Kubik
Fishery Biologist

Approved by:

s/Howard E. Metsker
D-J Coordinator

s/Rupert E. Andrews, Director
Division of Sport Fish